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(54) **Adhesive dispenser.**

(57) An adhesive dispenser comprising an adhesive conduit (12), a combination chamber (8) filled with fibrous support (22) bearing the catalyst which surrounds the conduit (12), and a fuel reservoir (7) which is connected to the combustion chamber (8) via the duct (9). Valve (10) controls the rate at which fuel is supplied to the combustion chamber (8) and the venturi (16) allows the fuel to mix with air, prior to combustion.

In one embodiment, combustion is initiated by use of switch (5) which energises the ignition filament (15) of the ignition device (19). Adhesive in solid stick form is fed into the conduit (12) from the spool (3) and emerges as a melt from nozzle (6). The fuel reservoir (7) may be recharged via valve (25).

The device provides a self contained and portable dispenser for hot melt adhesives.

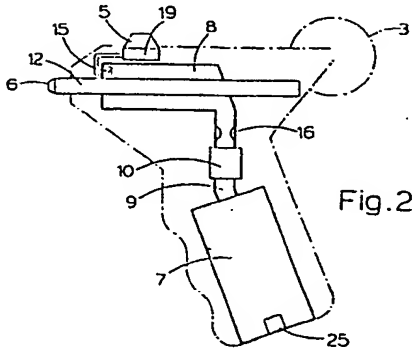

Fig.2

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ADHESIVE DISPENSER

The present invention relates to an adhesive dispenser for manually applying hot-melt adhesives to workpieces.

Hot-melt adhesives are supplied in solid form and must be heated and melted prior to application to the surfaces to be joined. In the past, it has been necessary to use large devices powered by mains electricity to melt and apply such adhesives. These are not fully portable and are cumbersome, thus being unsuitable for small-scale work such as handicrafts and do-it-yourself applications.

Accordingly the present invention provides an adhesive dispenser for manual application of hot-melt adhesives comprising a melting zone and a burner characterised in that the burner heats the melting zone by catalytic combustion of fluid fuel supplied by a reservoir for fluid fuel.

Suitably the burner comprises a catalyst on a fibrous support in thermal contact with the melting zone and is provided with a jet and venturi

for delivering a suitable mixture of gaseous fuel and air to the burner for combustion. Conveniently the catalyst is finely divided platinum metal deposited on a fibrous support such as a mineral fibre, for instance asbestos fibre or kao wool. Preferably the support has controlled porosity to allow an even distribution of fuel/air mixture. A suitable catalyst/support material is that supplied by BDH, Poole under the Trade Mark 'Triton Kaowool' which consists of 5% platinum on kao wool. A preferred catalyst/support material is that supplied by Engelhard industries for use in flameless catalytic heaters.

For use with such catalytic burners, fluid fuels are preferably relatively pure and free from sulphur compounds. Examples of suitable fuels are liquified propane and butane, such as the readily available cigarette lighter fuels.

The fuel is ignited either by sparks generated by a piezo electric device, a battery powered electric spark generator or by mechanical means such as a flint and serrated steel wheel, or preferably by a catalytic hot wire heated by an electric current. Suitable wires are fine platinum wires which when heated will ignite the fuel/air mixture. Once the fuel/air mixture has been ignited the heat of combustion maintains the catalytic burner at sufficient temperature to sustain combustion until the supply of fuel is cut off.

Preferably the device is provided with a valve for controlling the rate at which fuel is supplied to the burner and thereby regulating the temperature to which the adhesive is heated. Such a valve may be regulated manually or by a thermostatic device, and is advantageously combined with an on-off control on the fuel supply. Suitably the adhesive is heated to a temperature of between about 150°C to about 300°C.

The adhesive may be supplied in the form of short sticks, as with the prior art devices, which are advanced into the melting zone either by manual or mechanical means. Preferably the adhesive is supplied in the form of ribbon or wire having relatively small cross sectional area compared with conventional adhesive sticks. Such ribbon or wire is convenient in that it may be wound on a spool and supplied continuously to the melting zone. Moreover the use of such ribbon or wire enables the dimensions of the melting zone to be minimised thereby reducing the quantity of adhesive which must be melted before any may be applied to the work-piece and hence reducing the starting-up time. Obviously the dimensions of the ribbon or wire will depend on the physical properties of the adhesive but it is considered that for a wire a diameter in the region of 3 to 7 mm, preferably about 4 mm would be suitable for use with ethylene-vinylacetate hot-melt adhesives.

Advantageously the reservoir is provided with a valve through which additional fuel may be discharged into the reservoir. Alternatively the reservoir may be removable from the dispenser and may be recharged or interchanged with another, full reservoir when the fuel has been expended.

Dispensers according to the invention are self-contained in that no external power source is required and are, therefore, more portable than the prior art devices. Moreover the catalytic burner has a relatively lightweight construction compared with the electric heating elements in the prior art devices.

The invention will now be illustrated by reference to the Figures of the Drawings in which

Figure 1 shows a side elevation of a dispenser of the invention;

Figure 2 shows, in diagrammatic form, the internal layout of a dispenser;

Figure 3 (not to scale) shows the detailed construction of a burner in section;

Figure 4 shows, in diagrammatic form, the internal layout of an alternative dispenser; with the burner shown in section;

Figure 5 (not to scale) shows details of the combustion chamber and heating zone of the dispenser in Figure 4 sectioned on A-A.

Referring to Figure 1 the dispenser comprises a pistol grip 1 on which is mounted a control knob 14, and a body 2. A spool 3 carrying adhesive wire 4 is mounted on the rear of the body 2 and adhesive dispensing nozzle 6 projects from the front of the body 2. The body 2 is provided with grills 17 and 18 for air inlet and exhaust outlet respectively.

The internal components are shown in Figure 2 in which the outline of the dispenser is represented as a chained line. Reservoir 7 fitted with valve 25 by which fuel may be recharged, is contained in the pistol grip 1 and connects, via duct 9, control valve 10 and venturi 16 to combustion chamber 8.

Adhesive conduit 12 passes from the rear of the body 2 through the combustion chamber 8 and thence to the dispensing nozzle 6.

In Figure 3, venturi 16 comprises jet 20 and air inlets 21 which communicate with inlet grill 17 in body 2.

The combustion chamber 8, surrounding conduit 12, is filled with loosely packed fibrous support 22 bearing the catalyst. The ignition filament 15 is situated at the front end of the chamber 8 and is connected electrically to the ignition device 19, for which the circuit diagram is shown at 23, switch 24 being operated by ignition button 5.

When the dispenser is used adhesive 4 is advanced from spool 3 into the conduit 12 by manual rotation of spool 3. Fuel is allowed to flow under pressure from the reservoir 7 by opening control valve 10 and, having mixed with air at venturi 16 passes into the combustion chamber 8. The ignition button 5 is depressed completing the circuit 23 and heating filament 15. Filament 15 catalyses the initial combustion of the fuel, which heats the remainder of the catalyst 22. This in turn heats the conduit 12 and melts the adhesive 4. By advancing further adhesive 4 into conduit 12, molten adhesive is extruded from nozzle 6 and may then be applied to the workpiece. The temperature to which the adhesive is heated is regulated using control knob 14 to adjust valve 10. When not in use, valve 10 is closed to prevent escape of fuel.

Figures 4 and 5 show a dispenser as described with reference to Figures 1 to 3 with an alternative combustion chamber and heating zone 26 which comprises two chambers 27, and 28 separated by flanges 29, 30 on conduit 12. The duct 9 is connected to the lower chamber 27 near its front end 27a. At the other end 27b chamber 27 has two vents 31; which communicate with the upper chamber 28. Chamber 27 is filled with a loosely packed fibrous support 22 bearing the catalyst. The chamber 28 has exhaust vent 32 at its front end. The ignition filament 15 is situated inside the lower chamber 27 near the rear end 27b and is energised by a switch 5 located at the rear of the pistol grip.

In use the fuel-air mixture is burnt in chamber 27 and the hot exhaust gases pass along chamber 27 heating the lower surface of the conduit 12. The exhaust gases then pass through vents 31 into and along the upper chamber 28 heating the upper surface of the conduit 12 and finally pass out of the dispenser through the exhaust vents 32.

In an alternative embodiment the dispenser is provided with a trigger-operated mechanism to advance the adhesive wire 4, and/or a thermostatic control device to regulate the valve 10 and thereby adjust the temperature to which the adhesive is heated.

Claims

1. An adhesive dispenser for manual application of hot-melt adhesives comprising a melting zone (12) and a burner, characterised in that the burner heats the melting zone (12) by catalytic combustion of fluid fuel supplied by a reservoir (7) for fluid fuel.

2. An adhesive dispenser as claimed in claim 1, characterised in that the burner comprises a catalyst on a fibrous support (22) in thermal contact with the melting zone (12) and a jet (20) and venturi (16) for delivering a mixture of gaseous fuel and air to the burner for combustion.

3. An adhesive dispenser as claimed in either of claims 1 or 2, characterised in that the catalyst is finely divided platinum metal deposited on a fibrous support (22).

4. An adhesive dispenser as claimed in claim 3, characterised in that the fibrous support (22) is a mineral fibre.

5. An adhesive dispenser as claimed in any one of claims 1 to 4, characterised in that fuel is ignited by sparks generated by a piezo electric device or by a battery powered electric spark generator or by mechanical means or by a catalytic hot wire heated by an electric current.

6. An adhesive dispenser as claimed in any one of claims 1 to 5, characterised in that a valve (10) controls the rate at which fuel is supplied to the burner and thereby regulates the temperature to which the adhesive is heated.

7. An adhesive dispenser as claimed in any one of claims 1 to 6, characterised in that the adhesive is heated to a temperature of between about 150°C to about 300°C.

8. An adhesive dispenser as claimed in any one of claims 1 to 7, characterised in that the reservoir (7) is provided with a valve (25) through which additional fuel may be discharged into the reservoir.

9. An adhesive dispenser as claimed in any one of claims 1 to 7, characterised in that the reservoir (7) may be removable from the dispenser and may be recharged or interchanged with another full reservoir (7) when the fuel has been expended.

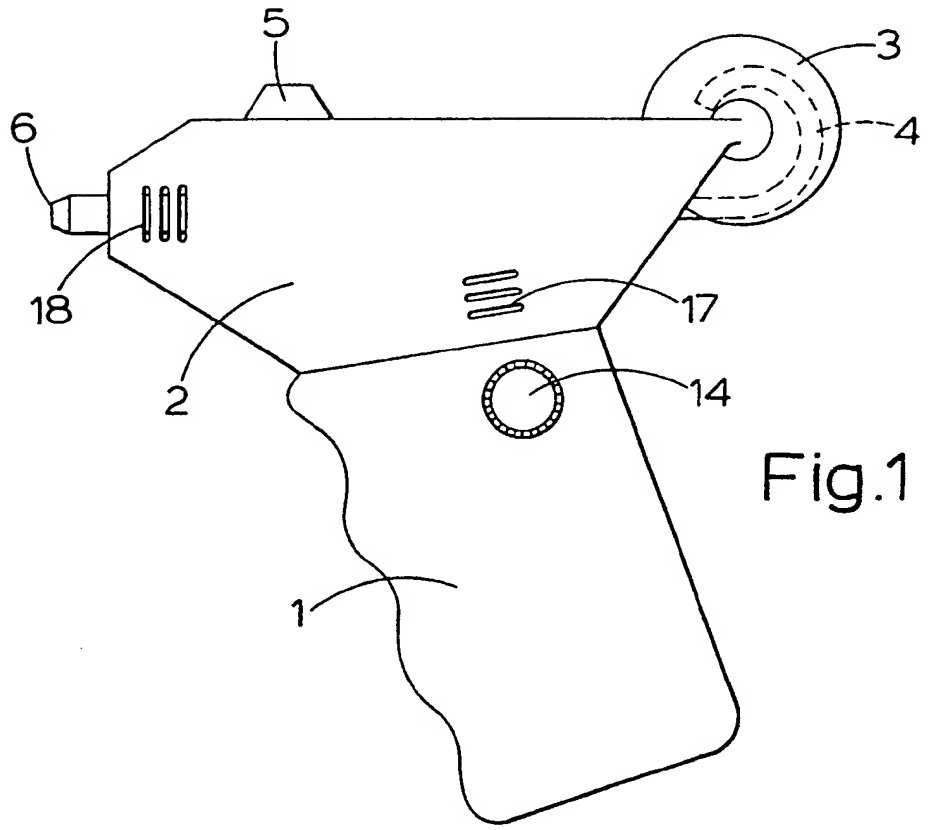

Fig.1

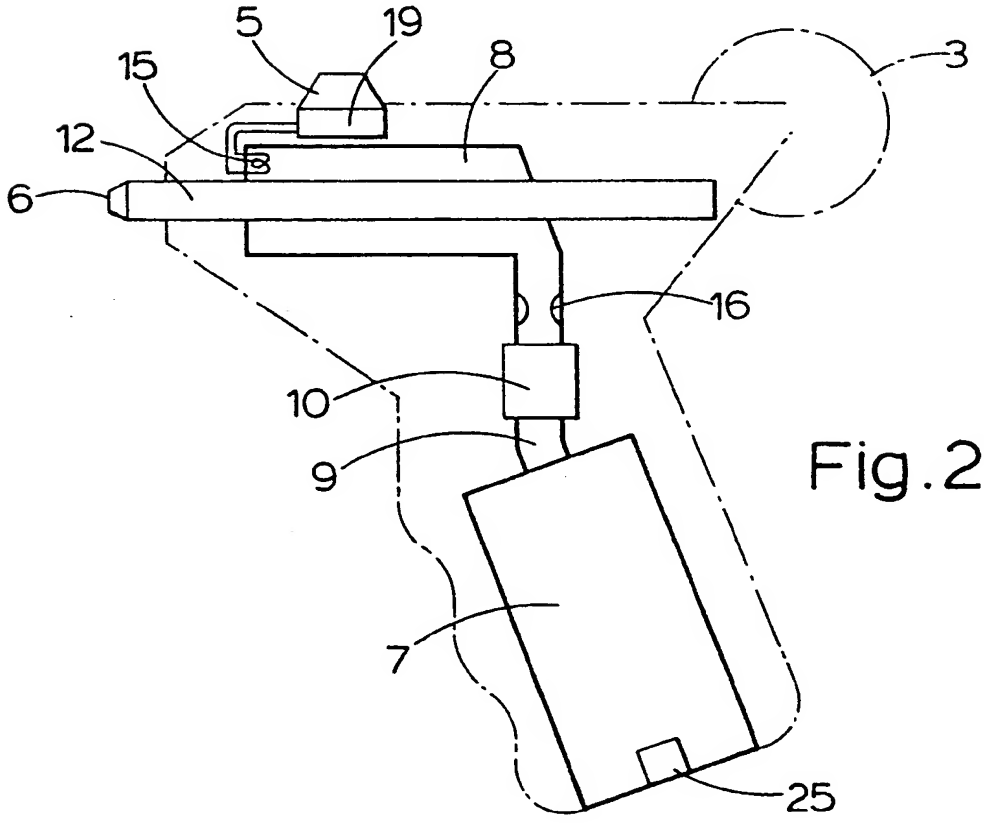

Fig.2

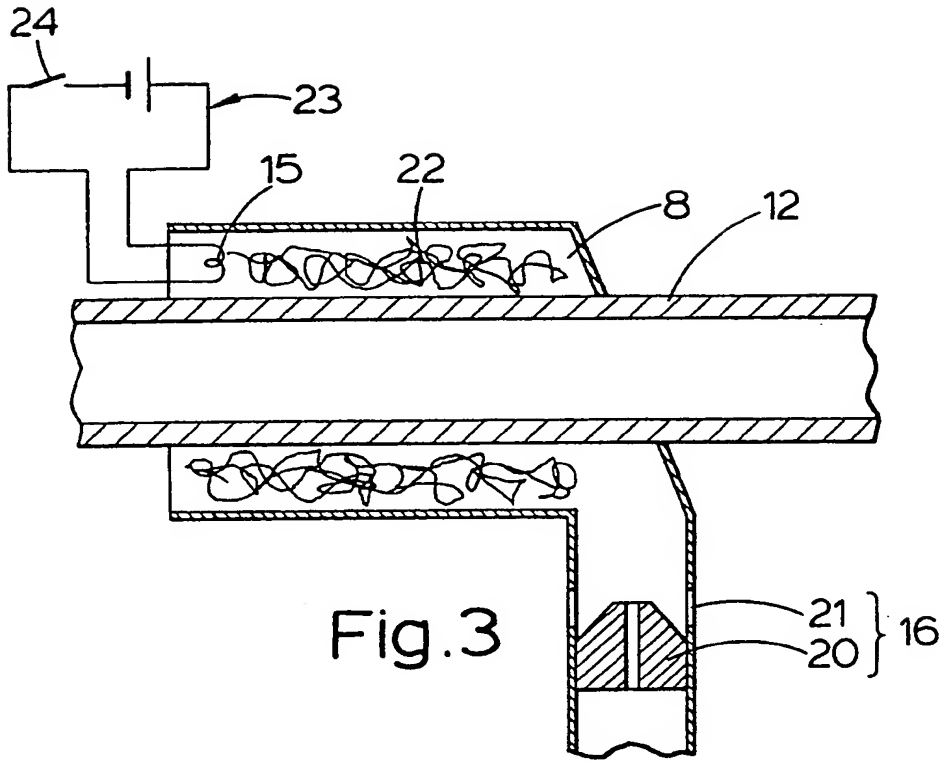

Fig.3

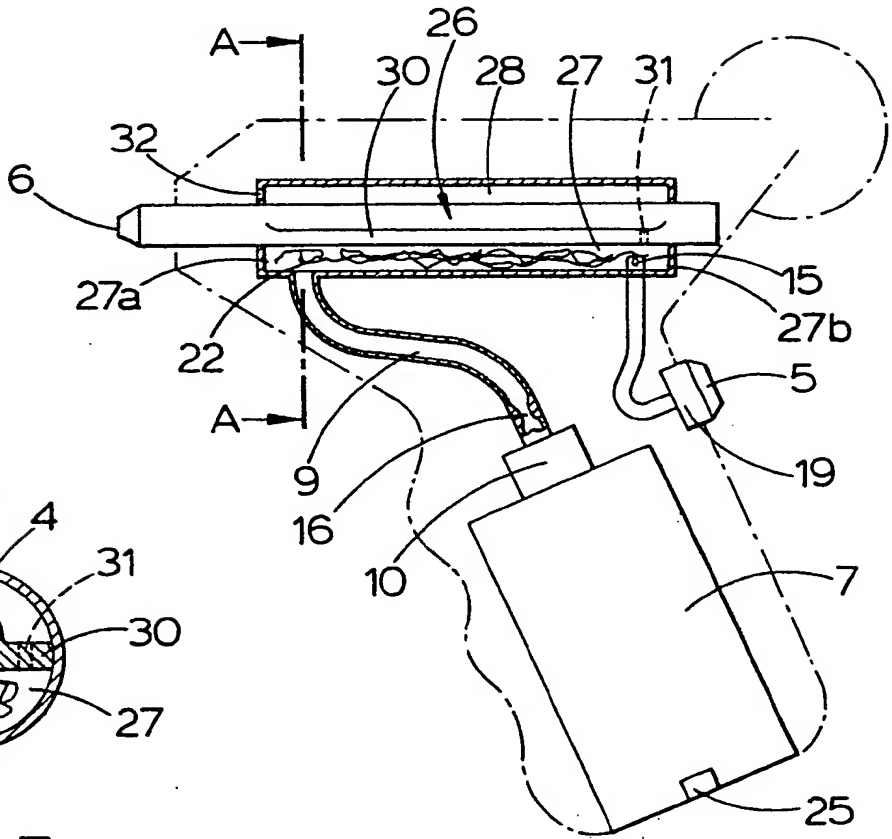

Fig.4

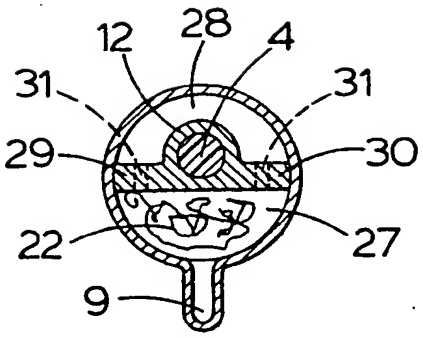

Fig.5

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EUROPEAN SEARCH REPORT

0123259
Application number

EP 84104344.1

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	EP - A2 - 0 055 350 (STEINEL KG.) * Claims; fig. 1 * --	1	B 05 C 17/00 B 05 C 5/04
A	US - A - 4 133 301 (FUJIWARA) * Fig. 1,5-8; column 11, lines 20-25 * --	1,5	
A	DE - A - 1 427 631 (RÜLING) * Claims; fig. 1 * --	1	
A	US - A - 2 689 801 (D'ALELIO) * Totality * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

B 05 C
B 23 K
B 05 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	17-07-1984	SCHÜTZ

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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